



Javier LOPEZ-GOMEZ

HPC/low-level Software Engineer

Madrid, Spain
✉ javier.lopez.gomez@proton.me
🌐 www.jalopezg.dev
in [javier-lopezgomez](https://www.linkedin.com/in/javier-lopezgomez)
🐙 [jalopezg-git](https://github.com/jalopezg-git)



👤 | Professional Profile

Experienced HPC and low-level C/C++ software engineer with expertise in Operating System internals, Microcontroller firmware, and Compiler design / implementation. Highly motivated, fast learner. Enjoys the development of complex software systems where efficiency matters.

💬 | Languages

Spanish	Native
English	C1
German	A1
French	A1

🔧 | Skills

Compiler Design / LLVM / clang	●●●●●	C/C++	●●●●●
Debugging (gdb, lldb) / Reverse Engineering / Assembly	●●●●●	Python / bash / AWK	●●●●●
OS Architecture / Linux kernel	●●●●●	GTK+ / Xlib	●●●●●
Embedded / Microcontroller-based Systems	●●●●●	MPI	●●●●●
Software and Network Security / TCP/IP stack	●●●●●	Win32 API	●●●●●
Technical Writing / Presentation	●●●●●	Git internals	●●●●●

📁 | Experience

- 2024– **Senior Compiler Engineer, Zimperium, Inc., Madrid**
Part of the engineering team of a solution for binary (AArch64) software protection. Top achievements:
 - Contributed a number of analyses (e.g. tagging based on use stack/frame pointer) and obfuscation passes.
 - Designed and implemented generator of unwind information / LSDA from the IR.
 - Pushed through protection of (1) well-known open-source applications; and (2) self-protection.
 - Participated in work for 2 patents in the area of software protection / integrity.
 - Authored 110+ merged pull requests and 250+ code reviews. Fixed critical issues in several components.
- 2025– **Vocal in CTN-UNE 71/SC22/GT21 (C++), UNE (Asociación Española de Normalización)**
Vocal in the CTN-UNE 71/SC22/GT21 (C++) national committee, w/ representation in the ISO International C++ Standards Committee as national expert.
- 2020–2023 **Senior Applied Fellow (Software for Experiments group, ROOT project), European Organization for Nuclear Research (CERN), Geneva, Switzerland**
Top achievements:
 - Contributions to RNTuple (the next-generation columnar I/O system for high-energy physics), outperforming HDF5 and Apache Parquet up to a factor of 2.2×. Specifically:
 - A storage backend for the Intel DAOS object store that provides up to ×16 improvement over DAOS dfuse compatibility layer
 - A mechanism to allow for incremental updates of the data schema, a unique feature not present in other columnar storage solutions
 - Further improvements in order to satisfy the requirements of the ATLAS LHC experiment, e.g. per-field post-read hooks and extensions to the type system. Liaison person for ATLAS I/O requirements.
 - Support for big-endian architectures and partial contributions to the design of zero-copy file merge
 - Notable contributions to the cling LLVM-based C++ interpreter, e.g. supporting entity redefinition and general improvements to the unloading infrastructure
 - Supervision of 5+ interns, mentor for CERN-HSF Google Summer of Code, and user training and support

- 2017–2020 ○ **Predocctoral Researcher (Computer Architecture and Technology Area), University Carlos III of Madrid**
Top achievements:
- Contributed a prototype implementation of C++ contract-based programming for clang, demonstrating that contracts may make some libstdc++ functions ~ 15% faster
 - Teaching Assistant in Real Time Systems, Operating Systems Design, Operating Systems, and Distributed Systems, achieving an average score of 4.23 out of 5 in the teacher evaluation surveys
 - July 2018 thesis defense committee member for BSc in Audiovisual System Engineering
 - Advisor in 4 theses (BSc in Computer Science and Engineering)
- 2012–2013 ○ **Associate Engineer (devtools), Tuenti Technologies S.L., Madrid**
Top achievements:
- Co-authorship of a program to generate test fixtures based on anonymized real-world data, aiding in improving the test coverage
 - Developed a utility for automated detection of mismatching application backend–database schema, assessing potential deployment issues
 - Contributed a tool to characterize the development environment
- 2006–2011 ○ **System Administrator and Software Developer, Grupo Microsyscom, Madrid**
Top achievements:
- Took the administration of Debian GNU/Linux and FreeBSD, incl. ISC dhcpd, BIND9, Apache httpd, MySQL, and Squid services for 5–10 external customers, ensuring continued service.
 - Implemented a RFB connection hub that relays data between a pair of RealVNC endpoints associated to a session identifier, reducing the time to start controlling a remote desktop by at least 5×
 - Contributed to the automated migration from BIND9 to 4PSA DNS Manager

| Education

- 2017–2020 ○ **Ph.D. in Computer Science and Technology, University Carlos III of Madrid**
Dissertation: “Balancing Perfomance and Reliability in Software Components”, graduated with honors – Cum laude
- 2016–2017 ○ **M.Sc. in Computer Science and Technology, University Carlos III of Madrid**
Thesis: “Automatic Classification of Drivers and Driving Style Using ECU Diagnostic Data”
- 2006–2011 ○ **B.Sc. in Computer Science and Engineering, University Carlos III of Madrid**
Thesis: “fsniff: A software suite for capturing and analyzing application I/O”, graded as passing with honors

| Selected Publications

Scientific Journals / Conferences

- **A caching mechanism to exploit object store speed in High Energy Physics analysis.** Cluster Computing (2022).
- **Relaxing the one definition rule in interpreted C++.** In Proceedings of the 29th International Conference on Compiler Construction (CC 2020).
- **Detecting semantic violations of lock-free data structures through C++ contracts.** The Journal of Supercomputing volume 76, pages 5057–5078 (2020).
- **Exploring stream parallel patterns in distributed MPI environments.** Parallel Computing, Volume 84, Issue C, May 2019, pp 24–36.

Filed Patents

- [U.S. Appl. #63/752,505] [co-author] **Tamper-Resistant Code Obfuscation With Control Flow Breaking.**
- [U.S. Appl. #19/042,905] [co-author] **Lightweight Code Integrity Solution With Byte-Pattern Entanglement In Program Code.**